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WAR ACTIVITIES OF THE UNITED STATES PUBLIC HEALTH SERVICE.[1]

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In describing the activities of the United States Public Health Service, so far as they were directly related to the prosecution of the war, it may be well to record that though many of these activities were not undertaken until 1918, developing as they did out of necessities arising as the war progressed, the need for most of them was foreseen by the service, and was made the subject of official recommendations. Thus, in a report dated February 4, 1917, two months before the entry of the United States into war, a board of officers of the United States Public Health Service formulated a program of activities which could be undertaken by the service in order to assist in the prosecution of the war. Among these are mentioned:

The sanitation of ports and places within the United States in order to prepare them for camps of mobilization, concentration, or training for the Army or Navy.

The sanitary supervision of mobilized industrial forces.

Medical and surgical relief to sick, wounded, or disabled soldiers and sailors at relief stations of the service.

Medical and surgical relief to mobilized industrial workers.

Laboratory operations, including both research and manufacture of serums and vaccines.

This was supplemented by a memorandum, dated April 7, 1917, outlining desirable activities of the United States Public Health Service in the field of industrial hygiene, especially as related to war industries.

It was clear that the carrying out of the contemplated war activities demanded a considerable increase in the personnel of the Public Health Service. In order that such an enlargement of the personnel might subsequently be available for other public health emergencies Congress was asked to authorize the establishment of a reserve in the Public Health Service, to consist of medical officers, sanitarians, engineers, and other qualified experts.

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[1] Reprinted, by permission, from the Medical Record, May 24, 1919.

A bill covering this matter was introduced into Congress and passed by the Senate on June 18, 1917, but was not adopted by the House of Representatives until more than a year later. The reserve act became a law on October 27, 1918.

However, without waiting for authority to establish a reserve, the pressing demands made upon the Public Health Service led to a great increase in the personnel of the service. Thus at the close of the fiscal year, June 30, 1917, the service consisted of 538 professional personnel, 1,506 other personnel, a total of 2,044; at the close of the fiscal year, June 30, 1918, the professional personnel amounted to 1,472, and the other personnel to 3,515, a total of 4,987. These figures do not include the personnel of the American Red Cross, or State and local health authorities operating under the direction of the service.

In the early part of 1918 it became evident that a number of different Government agencies were undertaking what were really Federal public health functions. It was realized that unless some plan of effective coordination was devised, there would be much duplication and waste of effort in this important field.

Under these circumstances, very soon after the passage of the Overman Act, the Public Health Service initiated action looking toward bringing all Federal civil health functions under the supervision and control of the Public Health Service. An Executive order effecting this was signed by the President on July 1, 1918. The text of this was as follows:

> *Whereas,* In order to avoid confusion in policies, duplication of effort, and to bring about more effective results, unity of control in the administration of the public health activities of the Federal Government is obviously essential, and has been so recognized by acts of Congress creating in the Treasury Department a Public Health Service, and specially authorizing such service "to study the diseases of man and the conditions influencing the propagation and spread thereof" and "to cooperate with and aid State and municipal boards of health":
>
> Now, therefore, I, Woodrow Wilson, President of the United States, by virtue of the authority vested in me as Chief Executive, and by the act "authorizing the President to coordinate or consolidate executive bureaus, agencies, and offices, and for other purposes, in the interest of economy and the more efficient concentration of the Government," approved May 20, 1918, do hereby order that all sanitary or public health activities carried on by any executive bureau, agency, or office, especially created for or concerned in the prosecution of the existing war, shall be exercised under the supervision and control of the Secretary of the Treasury.
>
> This order shall not be construed as affecting the jurisdiction exercised under authority of existing law by the Surgeon General of the Army, the Surgeon General of the Navy, and the Provost Marshal General in the performance of health functions which are military in character as distinguished from civil public health duties, or as prohibiting investigations by the Bureau of Labor Statistics of vocational diseases, shop sanitation, and hygiene.
>
> (Signed) WOODROW WILSON.
>
> THE WHITE HOUSE, July 1, 1918.

Before taking up the war activities of the Public Health Service in more detail, it may be well to point out that much of the work of the service in dealing with the pandemic of influenza in the fall of 1918 was imposed on the service because of the entry of more than 30,000 physicians practicing in the United States into military service. With the spread of the pandemic over the United States urgent calls were addressed by stricken communities to the Public Health Service for medical assistance. In response to this the Public Health Service organized a mobile corps of nearly 1,100 physicians and detailed these to render the needed medical attention. The emergency expenditures required for this and other purposes in dealing with the pandemic were met by a special appropriation of $1,000,000 voted by Congress on October 1, 1918.

In describing the war activities of the United States Public Health Service, it may be well to consider these under the following heads:

Sanitation of extra-cantonment areas.
Industrial hygiene.
Scientific research.
Production and supervision of biological products.
Campaign against venereal diseases.
Medical and surgical relief.
Miscellaneous activities.
Publications of the service.

Sanitation of Extra-Cantonment Areas.

Inauguration and organization of the work.—With the outbreak of the war it began to be realized that the backward state of public health administration throughout a large part of the United States threatened to constitute a distinct handicap to the country's military effectiveness. It was felt that this handicap could be materially reduced only by an intensive system of Federal health supervision in and about zones surrounding military camps and important industrial centers engaged in war work (mines, munition plants, shipyards). Within the camps themselves responsibility for the supervision and control of sanitary matters rested with the Army Medical Corps; their jurisdiction, however, ended with the camp boundaries and the Public Health Service was responsible for the correction of insanitary conditions which menaced them from without.

In the summer of 1917, in cooperation with the Army authorities and State and local health officers, the Public Health Service undertook to sanitate a zone around each of the 26 military cantonments; the end of 1918 saw 47 zones, most of them around military cantonments, under the operation of the Public Health Service. In most instances the officer of the service who was in charge of a zone was appointed by the State and local health authorities a deputy health officer. Inasmuch as the intensive health work was carried on primarily for the protection of the military forces and of industrial workers engaged in essential war work, it was manifestly unjust to ask the local communities to bear the entire expense involved. In the circumstances most of the work was done with Public Health Service sharing the expenses. Moreover, as described below, the American Red Cross maintained a number of sanitary units which rendered invaluable aid in the sanitation of these areas.

At the same time it was felt that the intensive health work carried on as a war measure should be made to constitute really a demonstration of profitable health activities and that every effort should be made to have the local and State health authorities continue the work after the war emergency had passed. To this end it was the aim to rouse a wider interest in health matters, to present the cost and the results of health work in the form of simple statements published in the local newspapers, to invite public attention to attainable results as shown by the experience of other communities—in short to seek in every way to make the people realize that "public health is purchasable."

American Red Cross.—It is certain that the work of the Public Health Service, especially as it related to the sanitation of extra-cantonment and industrial areas, was greatly facilitated by the effective aid rendered by the American Red Cross. At the request of the Surgeon General the War Council appropriated funds, and authorized sanitary units to be operated in such areas under the direction of officers of the Public Health Service. The first of these units was organized at Columbia, S. C., and by the end of the following year, January 1, 1919, 36 such units were in operation.

A Red Cross sanitary unit consisted of one or two bacteriologists, a chief sanitary inspector and a number of sanitary inspectors, a supervising public health nurse with the required number of assistants, clerks, stenographers, and laboratory assistants, and miscellaneous employees such as laborers, messengers, etc.

In addition to the salaries of these employees the Red Cross paid their traveling expenses, including, where necessary, the service of automobiles, and it also provided limited funds for sanitary necessities of the poor. The direction of the work of the sanitary unit was always lodged in an officer of the Public Health Service. Moreover, a general supervision over the work of the various Red Cross units was exercised by a senior officer of the United States Public Health Service, detailed to Red Cross headquarters as liaison officer.

Cooperation of State and local health authorities.—Without the cooperation on the part of the State and local health authorities it would have been impossible to carry on the intensive health activities dealing with the sanitation of extra-cantonment areas. In many instances this work was supported by funds supplied by State and local authorities. Such support was often invaluable because of the legal limitations on the character of expenditures by the Federal health authorities. In addition to this, officers of the Public Health Service detailed to extra-cantonment areas were usually given appointment as deputy health officers by the State and local authorities, thus arming them with the necessary authority to administer health regulations. It was often discovered that regulations were lacking to provide the desired control. In these cases model regulations prepared by the Public Health Service were recommended and were usually adopted by the proper local authorities.

Activities carried on.—The work done in the sanitation of the areas already mentioned has been of endless variety: In some rural areas it has consisted largely of measures designed to control the spread of malaria; in others, of efforts to provide proper disposal of human excreta, to protect drinking water, and to safeguard the milk supply; in urban communities, the home of important war industries, questions of sanitary housing, of the control of communicable diseases, of industrial hygiene demanded a large share of attention.

Some idea of the magnitude of this undertaking can be gained from the following list of places where this intensive health supervision was maintained:

EXTRA-CANTONMENT ZONES.

Following is a list of the extra-cantonment areas where the Public Health Service carried on intensive health supervision, and where Red Cross sanitary units were operated:

Alexandria, La	Sanitary unit No. 22.
Alexandria, Va	Sanitary unit No. 31.
Americus, Ga	Extra-cantonment zone only.
American Lake, Wash	Sanitary unit No. 18.
Anniston, Ala	Sanitary unit No. 8.
Atlanta, Ga	Sanitary unit No. 11.
Augusta, Ga	Sanitary unit No. 25.
Ayer, Mass	Sanitary unit No. 10.
Brunswick, Ga	Extra-cantonment zone only.
Charleston, S. C	Sanitary unit No. 33.
Charlotte, N. C	Sanitary unit No. 20.
Chattanooga, Tenn	Sanitary unit No. 16.
Chillicothe, Ohio	Sanitary unit No. 12.
Columbia, S. C	Sanitary unit No. 1.
Columbus, Ga	Extra-cantonment zone only.
Des Moines, Iowa	Sanitary unit No. 4.
El Paso, Tex	Sanitary unit No. 24.
Fayetteville, N. C	Sanitary unit No. 35.
Florence, Ala	Extra-cantonment zone only.
Fort Worth, Tex	Sanitary unit No. 23.

Gulfport, Miss	Extra-cantonment zone only.
Greenville, S. C	Sanitary unit No. 13.
Hattiesburg, Miss	Sanitary unit No. 6.
Houston, Tex	Sanitary unit No. 27.
Jacksonville, Fla	Sanitary unit No. 29.
Lawton, Okla	Sanitary unit No. 34.
Leavenworth, Kans	Sanitary unit No. 5.
Lake Charles, La	Extra-cantonment zone only.
Louisville, Ky	Sanitary unit No. 3.
Little Rock, Ark	Sanitary unit No. 2.
Millington, Tenn	Extra-cantonment zone only.
Macon, Ga	Sanitary unit No. 14.
Manhattan, Kans	Sanitary unit No. 15.
Montgomery, Ala	Sanitary unit No. 19.
New London, Conn	Sanitary unit No. 32.
Newport News, Va	Sanitary unit No. 9.
Petersburg, Va	Sanitary unit No. 7.
Portsmouth, Va	Sanitary unit No. 28.
Portsmouth, N. H	Sanitary unit No. 30.
Pensacola, Fla	Extra-cantonment zone only.
Raleigh, N. C	Extra-cantonment zone only.
San Antonio, Tex	Sanitary unit No. 26.
Seattle, Wash	Extra-cantonment zone only.
Spartanburg, S. C	Sanitary unit No. 17.
Tacoma, Wash	Extra-cantonment zone only.
Waco, Tex	Sanitary unit No. 21.
West Point, Miss	Extra-cantonment zone only.
Wilmington, N. C	Extra-cantonment zone only.
Washington, D. C	Sanitary unit No. 26.
Wrightstown, N. J	Sanitary unit only.

The organization built up to deal with the sanitation of extra-cantonment areas dovetailed into the existing local health machinery, thus making up a complete sanitary unit. The amount and character of the work done by the United States Public Health Service therefore varied, in the different areas, according to the amount and character of the work which State, city, county, or other local health authorities were willing and able to do. Altogether the end of the year 1918 found 49 commissioned medical officers and 72 acting assistant surgeons engaged in this work by the United States Public Health Service. These, with sanitary engineers, scientific assistants, epidemiologists, sanitary inspectors, and public health nurses, made up a total force of over 500, exclusive of laborers.

Following is a more detailed description of the activities carried on to sanitate these special areas:

Malaria control.—In general it has been the aim of the Public Health Service to establish around each cantonment a mile-wide belt entirely free from mosquito-breeding places. The means to attain this has varied with the local conditions. In some instances extensive swamp areas have been ditched and drained, in others sluggish water courses have been channeled and straightened, here small ponds have been drained dry, there they have been filled in; in still other cases they have been oiled. Now and then it was feasible to poison mosquito-breeding waters by turning into them industrial wastes.

Altogether, the total area in and about camps and war-industrial communities which was thus treated to prevent the breeding of mosquitoes was over 1,200 square miles. The total cost of the work was $1,300,000, of which approximately 35 per cent was obtained locally. Nearly 2,500 miles of ditches were dug and the population protected by these measures was 1,730,000 civilian population and an average of 826,000 military population.

Illustrative of the operations carried on it may be mentioned that at Park Field, near Memphis, about half of the work consisted in regrading and clearing natural water courses. The total area involved was 16 square miles, and the total cost was $65,000.

In other areas, especially where the soil was free from roots, the antimosquito work consisted largely of cutting V-shaped ditches with a horse plow. Such ditches were from 18 to 25 inches deep and about 2½ to 3 feet in width at the top. Much of the work at Montgomery, Ala., was of this type. There, approximately 86 square miles were protected at a cost of $45,000, involving the cutting of 123 linear miles of light ditches.

In still other areas it was necessary to cut and clean an outlet to a swamp and to secure good drainage of such camps when water levels were favorable. This often involved heavy operations, even including blasting with dynamite. The costs have varied considerably depending on local conditions. Operations of this kind were carried on at Macon, Ga. They protected an area of 26 square miles, involved the cutting of 50 linear miles of ditches, and cost $107,000. Similar work was carried on at Hattiesburg, Miss.

General sanitation.—Under this head are embraced a number of health activities having to do largely with the correction of the insanitary environment of the rural population usually in a zone from 1 to 5 miles wide around the military cantonments. Much of the work consisted in the improvement of local water supplies and in provision for the safe disposal of human excreta. In connection with the latter, in some communities the double-compartment concrete vault type of privy was largely introduced; in others, sanitary pails combined with scavenger system were utilized. In all cases attention was given to preventing the spread of diseases of excretal origin by flies.

Vaccination.—In order to reduce to a minimum the prevalence of smallpox and typhoid fever in the extra-cantonment areas much emphasis was placed on protective vaccination. Smallpox and typhoid vaccines prepared by the Hygienic Laboratory were administered by officers of the Public Health Service. The extent of this activity is indicated by the following figures showing total vaccinations in the extra-cantonment areas:

Antityphoid inoculations	259, 888
Smallpox vaccination	107, 497

Morbidity reports.—With the inauguration of the intensive health work in the extra-cantonment areas, the possibility was presented of securing more complete morbidity reports than had previously been received from any miscellaneous group of the population. Arrangements were accordingly made to secure the following regular reports:

1. Daily morbidity reports, mailed to the Public Health Service.
2. Weekly telegraphic reports, for publication in "Public Health Reports."
3. Records of individual cases of illness, showing diagnosis, age, sex, color, occupation, date of onset, and termination of the disease.

One of the important outcomes of the collection of these morbidity reports was the possibility of currently transmitting the information thus obtained to the medical authorities of the Army and Navy and the Council of National Defense. Accordingly, daily statements were prepared for this purpose containing the following:

1. Transcripts of monthly reports from collaborating epidemiologists and State health officers. (This information was thus available to the military authorities prior to publication in "Public Health Reports.")
2. Transcripts of the daily health reports from the extra-cantonment areas.
3. Transcripts of weekly postal card morbidity reports from the larger cities.
4. Information of unusual or immediate importance relative to the prevalence of disease.

Health education.—Much of the work in the extra-cantonment areas was necessarily educational, and was carried on largely by personal visits to the individual homes by public health nurses or sanitary inspectors. At these visits attention was called to matters relating to child hygiene, to the importance of cleanliness and the proper disposal of human excreta, the need of pure water and milk supplies, the rôle of flies in the transmission of disease, the recognition and prevention of communicable diseases, the control of mosquito breeding, and any other matters of special importance to the particular home visited.

Typhoid-fever index.—Among the different statistical indices in use by sanitarians for measuring the results of public health activities, the prevalence of typhoid fever has generally been accepted as simple, useful, and reliable. Omitting those extra-cantonment areas which were not established until after the beginning of 1918, the carefully collected morbidity reports from these areas show a total of 2,835 cases of typhoid fever, in 31 areas having a total population of at least 3,033,000. This is equivalent to a morbidity rate of 93.5 per 100,000 population, and an estimated mortality rate, according to the usual method of calculation, of 9.35 per 100,000 population.

This rate may fairly be compared to the typhoid fever rate of the United States registration area, which was 13.3 in 1916 (the latest figures available). As a matter of fact the results achieved were even more favorable, for inasmuch as most of these extra-cantonment areas were located in the South, the comparison should really be made with the typhoid rate of that part of the country. Such a comparison has been made in the following tabulations:

Typhoid death rates per 100,000.

Texas (1917)	19.2	Extra-cantonment areas (1918)	11.0
Georgia (1916)	22.0	Extra-cantonment areas (1918)	7.6
Virginia (1916)	25.1	Extra-cantonment areas (1918)	9.8
South Carolina (1916)	34.1	Extra-cantonment areas (1918)	7.2
Alabama (1917)	38.0	Extra-cantonment areas (1918)	15.1

Altogether, the conclusion is warranted that the public health activities carried on in the extra-cantonment areas resulted in a marked improvement in sanitary conditions and a consequent high degree of health protection not only to the people living in these areas but to those in the military and industrial camps there located.

Malaria index.—It may be mentioned that malaria, which was a serious potential disability factor about many of the camps, especially those located in the South, was practically eliminated from the soldier population and only 3,160 cases were reported to the Public Health Service during the malarial season of 1918 from among the civil population of three and three-quarter million, a rate of 83 per 100,000. From such data as are obtainable from previous years this was a tremendous reduction in the malarial rate in these communities. These results may well be compared with those in Panama, especially since they were obtained, not under military conditions but through the voluntary work of a civil population.

Industrial Hygiene.

An important contribution to promoting efficiency in war industries consisted in the health and sanitary supervision of these industries by the Public Health Service.

In cooperation with the Safety and Sanitation Division of the Industrial Service Section of the Ordnance Department, officers of the Public Health Service conducted examinations as to the hygienic conditions of the explosives industry in such plants as—

The Etna Explosive Co., Mount Union, Pa., and Emporium, Pa.
The Atlas Powder Co., Webster, Pa., and Perry Point, Perryville, Md.
McArthur Bros.' Bag Loading Co., Woodbury, N. J.
Nitrate Plant No. 2, Muscle Shoals, Ala.
Penn Trojan Powder Co. and Chemical Co, Allentown, Pa.
Picric Acid Plant, Brunswick, Va.
Quaker Valley Works of John B. Semple Co., Sewickley, Pa.
Roessler & Hasslacher Chemical Co., Perth Amboy, N. J.
Tullytown Bag Loading Co., Niagara Falls, N. Y.
U. S. Explosives Plant, No. 6, Nitro, W. Va.
U. S. Nitrate Plant, Toledo, Ohio.
Western Cartridge Co., West Alton, Ill.

Particular attention was paid to the subjects of T. N. T. poisoning and poisoning from other comparatively new similar chemicals and explosive compounds. Laboratory work incident thereto was done by the Hygienic Laboratory and the National Research Council.

The Public Health Service also conducted investigations of the sanitary condition of a number of large aniline and other chemical factories; the electro-chemical industry of Niagara Falls, as well as the storage battery and abrasive industries.

Surveys were also made of health conditions of establishments manufacturing uniforms and other articles of clothing equipment for the United States Army, mostly in the State of Ohio.

The demonstration at Nitro, W. Va.—On the theory that the Government should take the lead in demonstrating how to safeguard the health of industrial workers, arrangements were made at the request of the Secretary of War to have the United States Public Health Service undertake the sanitation and medical and surgical relief at the United States explosives plant located at Nitro, W. Va. Some idea of the magnitude of the work thus undertaken by the Public Health Service may be gained from the fact that it required the services of 35 medical officers, 80 nurses, and numerous other persons including laborers, artisans and clerks. The total personnel was about 500, not including laborers in the sanitary department, who numbered approximately 300.

Inasmuch as the sanitary and medical work began with the construction of the plant, the work at first had to do largely with the health supervision of the large army of temporary employees engaged in construction work; subsequently, as this phase of activity subsided, matters of industrial hygiene arising with the operation of the plant required an increasing amount of attention. A brief summary of the more important phases of this work may be of interest.

Examination of applicants for employment.—A suitable building was erected and properly fitted out, both in supplies, equipment, and personnel, for the purpose of examining physically all applicants for employment. In this way it was possible to control the introduction of dangerous communicable diseases and to reject for employment those disqualified by disease or physical defects. Out of the 45,858 applicants examined to July 1, 1918, only 0.8 per cent were permanently rejected for employment. In addition to this 1.8 per cent were rejected temporarily. Most of the latter were cases of venereal disease, and the infected individuals were referred immediately to the proper department for treatment. In most cases as soon as they were under proper medical treatment these persons were put to work. In this way the labor supply was conserved and the men were not refused the opportunity to earn a living because of their unfortunate infection. Of the total number of applicants accepted for employment 11 per cent had marked physical disabilities, such as defects of sight, of hearing, of loss of fingers or of entire limbs. With proper attention to the placing of these individuals, practically no interference with efficient labor resulted.

Delousing.—As a result of the physical examination, 1,690 individuals were discovered to be infested with lice. The infested men were temporarily placed in a detention barracks, and then sent through the delousing house. Here they were subjected to a cleansing bath, medical inspection, and treatment. In the meantime, their clothing was run through the sterilizer. Their bed clothing was placed in a small air-tight building and subjected to cyanide fumigation.

It is of interest to note, however, that in spite of most rigid inspection and treatment, cases of pediculosis constantly escaped notice, to be discovered at a later date.

Vaccination and typhoid inoculation.—At the time of enrollment the men were vaccinated against smallpox and were also encouraged to receive typhoid inoculation. By means of the persistent health propaganda carried on, it has been possible to spread the knowledge of the value of these measures among those employed at this plant with the result that 116,668 persons have received the prophylactic typhoid inoculation, and 76,920 persons smallpox vaccination. Owing to the many changes among the people employed at the plant, it was not possible to complete the course of treatment in many of these cases of typhoid inoculation. By far the great majority who remained at the plant have completed this treatment.

Hygiene of Housing.—During the period of construction practically all persons engaged at the plant were housed in barracks similar to those used by the Army during mobilization. These barracks number 27, and are 160 feet in length by 48 feet in width and 18 feet high, providing 7,680 square feet of floor space and 69,120 cubic feet of air to each floor. They are two stories in height, with 34 regulation windows on either side and 12 on the ends. They are equipped with 100 double-deck iron beds on the second floor, and 50 double-deck iron beds on the first floor, one-half of the first floor being used as a recreation room. These barracks house 300 men each. Twenty bunk houses, 120 feet long by 24 feet wide and 8 feet high, also offer facilities for sleeping quarters of the laborers. These are likewise equipped with double-deck beds.

Between each barracks building and bunk house is a bath house connecting with the barracks by a covered passageway.

Bungalow housing.—Various employees, mostly administrative officers and office force, were housed in the bungalow section apart from the barracks section. The total number living under these conditions was relatively small at first, numbering possibly 1,500 persons, but later increased to approximately 10,000.

Medical and surgical relief.—Four six-bed emergency dressing stations were constructed in connection with the plant. In addition to this there was a 40-bed emergency hospital, an 80-bed isolation hospital, a 325-bed general hospital, and a dispensary in the bungalow section; the last named was for handling bungalow visits and giving dispensary service to the bungalow occupants. In addition to the relief of those actually ill or injured, medical relief was given those afflicted with disabilities, and to constructive and repair work in connection with eye, ear, nose and throat and dental affections.

Sanitation.—The problem of sanitation required both temporary and permanent measures. Under the former are embraced the measures taken to provide a safe disposal of excreta of the many thousand employees engaged in the construction of the plant; to maintain in sanitary conditions the stables for the several thousand horses and mules used in construction work; the provision of pure drinking water; the disposal of rubbish and garbage; the maintenance of sanitary kitchen and mess halls; inspection of all food—in short, such matters of general sanitation as generally arise in the maintenance of a large construction camp. Under the temporary measures, in order to furnish a safe water supply, a small chlorinating plant was installed, and several deep wells were drilled. From these, water was delivered to the whole plant. Under the permanent sanitary measures may be enumerated provision of a safe water supply; construction and maintenance of an adequate sewerage system and sewage disposal; inauguration of a system of street cleaning, including garbage and refuse collection and disposal; establishment of a system of food supervision.

A permanent water system was installed with necessary filters to supply a city of 35,000 population, and chemical and bacteriological analyses of this water were made daily in the laboratories at the hospital.

All food entering the plant was shipped to the commissary warehouses and refrigerating plant, and there inspected by the food inspectors, and likewise again inspected in the commissary stores and mess halls before being consumed.

Occupational health hazards.—The gradual completion of the plant witnessed the inauguration of the industrial operation for which the plant was established; that is, the production of smokeless powder. Some of the health hazards met with during operation are as follows: Nitric and sulphuric acid burns, caustic alkali burns, the inhalation of nitrous and sulphuric fumes and of chlorine, excessive heat and humidity, alcohol and ether intoxication, poisoning by diphenylamine, and burns from a flare or sudden burning of powder. In order to lessen these hazards an educational campaign was conducted by medical officers instructing the workmen in the dangers and the first-aid treatment to be employed. One hundred and twenty-five stretcher outfits, containing each one stretcher and one blanket, were scattered through the plant, being easily accessible to those who might be injured, and the nearness of the field emergency stations made it possible to render medical service almost immediately upon the occurrence of an accident. Three motor ambulances were stationed at the emergency hospital, having free access to all parts of the reservation. First-aid boxes were installed in all places deemed advisable for immediate relief, and shower-bath facilities were installed in the acid area for bad acid burns.

Scientific Research.

Industrial fatigue.—With the necessity imposed by the war to conduct its industrial operations at the highest possible degree of efficiency, the Public Health Service at once became vitally interested in the relation of industrial fatigue to efficiency. In cooperation with the divisional committee on industrial fatigue of the Council of National Defense, the Service in the summer of 1917 began an extensive investigation of this important health problem.

While a considerable number of factories were visited, detailed studies were limited to two large establishments which offered exceptional opportunities for observation. One of the main objects in view was the determination of the conditions under which the operatives, the human machines of the factory, can perform their work with the highest degree of efficiency. The subjects considered included output, night work, effect of recess periods, accidents, and physiological tests for fatigue. A summary of the results of these studies was published in the annual report of the Public Health Service for the fiscal year ending June 30, 1918.

Trinitrotoluol poisoning.—At the Hygienic Laboratory systematic studies were commenced in regard to the methods of absorption, detection, and prevention of trinitrotoluol poisoning. These studies are expected to be of great assistance in providing sanitary requirements which will minimize the danger from trinotrotoluol, a substance which is used principally as a charge in high-explosive shells. The manufacture of trinitrotoluol is surrounded with considerable risk of poisoning.

The investigation related to:

1. Simple diagnostic tests for the recognition of early poisoning.
2. A preventive skin wash for the efficient removal of T. N. T.
3. The relative importance of absorption of the poison through the skin and the respiratory passages.
4. The prophylactic value of proper diet.
5. The incidence of poisoning in one of the larger shell-loading plants.

Nutritive value of various kinds of flour and bread.—At the Hygienic Laboratory an extensive investigation covering a period of nearly two years has shown that highly milled flour and bread made from this flour are considerably inferior in vitamine content to the "low extraction" flours now so extensively used in European countries. This conclusion was reached from well-planned feeding experiments on animals, in which all extraneous and complicating factors were eliminated. One of the main objections against the "low extraction" flour, namely, its excessive cellulose content, could easily be overcome by a method of milling which would permit the elimination of a greater part of the bran.

Influence of heat on the vitamine content of beef.—Another investigation bearing quite directly on war matters was one carried on by the Hygienic Laboratory to determine whether the canning process robbed meat of the so-called vitamine present in fresh meat. The work has conclusively shown that under ordinary conditions beef does not lose any of its vitamine content when heated for three hours to 120° C.

Studies on dermatitis from mercury fulminate and parazol.—At the request of the Ordnance Department of the Army and of the United States Navy an investigation was undertaken to devise means of preventing the severe dermatitis which results from mercury fulminate and parazol respectively. A protective skin varnish against parazol was developed.

Antitoxin against gas gangrene.—The Hygienic Laboratory was called upon to prepare and standardize an antitoxin against gas gangrene. Considerable work on gas gangrene has been done by investigators abroad, but no definite results have been obtained. The studies conducted by the Hygienic Laboratory resulted in a method of standardization for perfringens antitoxin for gas gangrene.

Laboratory studies on arsphenamine.—Up to the time of the outbreak of the war, arsphenamine (salvarsan) was exclusively manufactured in Germany and was protected by patents in most countries.

As a result of the war the supply in the United States was seriously reduced, particularly on account of the blockade, which made it impossible to secure enough of the German product. In 1916 a few private institutions began the manufacture of arsphenamine in the United States, under an agreement with the Farbwerke Hoechst Co., the German holders of the patent in this country. Soon after the declaration of war by the United States the patent on salvarsan was suspended and the Federal Trade Commission was authorized by Congress to issue licenses for the manufacture and sale of the drug. The manufacture of arsphenamine is extremely difficult and results very often in a product of high toxicity which is dangerous to the life of the patient. Hence it is absolutely essential to control the commercial product by proper toxicity tests before the drug is released for sale to the medical profession. These circumstances therefore necessitated the adoption of a satisfactory method for this purpose, and after considerable work such a method was developed. Standards of toxicity for arsphenamine, submitted to the Federal Trade Commission, were accepted and the manufacturer was required to test his product by means of the method developed at the Hygienic Laboratory. This laboratory furthermore controlled the commercial product by testing many hundred samples submitted by the manufacturer. In addition to the toxicological tests, chemical standards were worked out so as to insure, as much as possible, uniformity in the therapeutic value of the drug.

An investigation was conducted into the process of manufacture of arsphenamine. The work was done at the Hygienic Laboratory, the University of Chicago, and at one of the larger plants where arsphenamine was produced. This led to marked improvement in the quality of this particular brand of arsphenamine and removed the serious shortage of the drug at the beginning of the year 1918. As a result of this work the Army and Navy were able to secure a sufficient supply of the drug.

Another phase of the arsphenamine work had for its purpose the elimination of the untoward reactions sometimes following the administration of the drug to patients. It appeared particularly important to determine the causes of these reactions and to discover means for their prevention and treatment. The work was divided into:

1. A study of the cause of the circulatory and respiratory reactions (nitritoid crises).
2. The study of arsphenamine nephritis. Considerable progress has been made on this subject and upon completion of the work it is hoped that certain definite recommendations will be available which will eliminate some of the disadvantages possessed by this drug and prevent the deaths occasionally resulting from its use.

Miscellaneous laboratory examinations.—In connection with the rumors that many kinds of contaminations, poisons and glass were being introduced into food by enemy sympathizers, the Hygienic Laboratory examined specimens from suspicious cases submitted by officers of the Government. The specimens covered an exceedingly wide range of objects, such as candy, cakes, bread, pies, breakfast foods, and dried and preserved fruits. The most interesting of these specimens were those of court plaster, sent to the laboratory because it was suspected by the general public that German agents had introduced tetanus bacilli into the court plaster and then had peddled the plaster to the public. Thirteen samples of the suspected court plaster were examined and tetanus bacilli were found in two samples. This was so interesting that the laboratory deemed it advisable to go into these investigations more thoroughly. Accordingly, numerous samples of court plaster were purchased in drug stores in the open market and submitted to examination. The result showed that a number of the specimens contained tetanus bacilli and that the presence of these bacilli was due to insufficient sterilization of the gelatin used in the plaster.

Another interesting case was the appearance of anthrax in several cantonments among the users of new shaving brushes. Several soldiers who had purchased new shaving brushes developed anthrax with fatal results. The brushes which they used were submitted to the Hygienic Laboratory and the examination showed the presence of anthrax spores in the bristles. The manufacturers of the various brushes were communicated with and their cooperation was secured in solving this interesting problem. It appeared that the bristles used in the manufacture of shaving brushes are to a large extent imported from China. It further appeared that although the bristles were cleansed by ordinary scrubbing, they were not really sterilized. Under these circumstances it is readily seen that anthrax infection in an animal whose bristles were used for shaving brushes could be transferred to the user of the shaving brush. Regulations governing the sterilization of bristles used in the shaving brushes were prepared under the authority of the Interstate Quarantine Act.

Production and Supervision of Biological Products.

The entry of America into the war resulted in an enormous increase in the production and use of serums, toxins, and analogous products. As all manufacturers of these products are licensed by the Federal Government and as the law provides for the examination and control of the products and for the inspection of the manufactories, an immensely increased amount of work was thrown upon the Hygienic Laboratory. It was particularly necessary that every lot should be tested before being released for use in the Army or the Navy, as these two services depended entirely upon the reports of tests made at this institution. Promptness was an important factor. The outbreak of meningitis and pneumonia in the military camps was the signal for using vast quantities of specific sera for these infections. These sera were standardized in the Hygienic Laboratory, and manufacturers were instructed to comply with these tentative standards.

In order to help protect the military forces against typhoid fever considerable attention was devoted to the control and eradication of typhoid infection from extra-cantonment areas. In this work extensive use was made of antityphoid inoculations. The vaccine for this purpose was prepared and furnished by the Hygienic Laboratory. In this connection the following table will be of interest:

Production of typhoid vaccine.

Fiscal year ending:	Cc. produced.
June 30, 1914	4,892
June 30, 1915	17,248
June 30, 1916	16,075
June 30, 1917	99,889
June 30, 1918	348,275
July 1 to Dec. 1, 1918	612,908

During the period of the war 1,102,812 cc. of bacterial vaccine were distributed. This includes typhoid, paratyphoid, and the so-called "triple vaccine." The manufacture of the last named was begun in 1917.

Campaign Against Venereal Diseases.

Inasmuch as venereal infection had regularly exacted a heavy toll from military forces, and because experience had shown that the source of this infection was principally an infected civilian population, the outbreak of the war naturally focused the attention of civilian health authorities on the control of venereal diseases to the end that the military forces might be protected. Prior to the war a number of progressive States had begun to deal with this problem, and in general the result of their activities had demonstrated a practicable plan by which health authorities might hope to secure some measure of control of the venereal diseases. There was lacking, however, any nation-wide interest in this important health problem, and, still more important, very little disposition on the part of most State authorities to provide funds for anything approaching an adequate plan of control.

Charged as it is with the control and prevention of communicable diseases spread from State to State, the Public Health Service realized that it had a definite responsibility in organizing an effective campaign for the control of venereal diseases.

Accordingly, through its Division of Domestic Quarantine, it outlined a plan whereby the Public Health Service would cooperate with State health authorities in effective antivenereal disease control. Briefly summarized, the plan provided for the appointment of an officer in each State to direct the work of venereal disease control. The salary of such officer, selected by the State health officer, was to be paid by the State and Federal Governments jointly. Each State was at once to provide for the notification of all cases of venereal disease, and to make provision for the extension of facilities for early diagnosis and treatment. Repressive measures, looking to isolation and treatment of dangerously infected individuals, and educational measures for the general public as well as for the infected persons, were also to be provided for.

Under the stimulus of the war emergency a considerable number of States accepted the plan of cooperation just outlined. Nevertheless it is certain that nowhere near the progress that actually has been made would have been made had it not been for the Federal financial aid given by the so-called Chamberlain-Kahn Act approved July 9, 1918.

Under the provisions of this act allotments were made to each of the various States. Such allotments were to be expended in accordance with the rules and regulations promulgated by the Secretary of the Treasury. These provide that approximately 50 per cent of the State's allotment is to be used in treatment of venereal diseases; 20 per cent for the educational work; 20 per cent for law enforcement; and 10 per cent for administration.

At the present time venereal disease clinics are being conducted in 28 extra-cantonment zones, and 112 in other locations. During the period of one year—1918—22,441 cases of venereal diseases were treated in the extra-cantonment clinics. These cases were divided as follows: Syphilis, 9,250; gonorrhea, 12,210; chancroid, 981. At each of these clinics a circular is handed to the patients, giving important confidential information in regard to syphilis and gonorrhea.

At the time of the second draft the Provost Marshal General of the Army requested the Public Health Service to carry on a campaign of education among the drafted men. Lecturers were appointed and nine regional supervisors were placed on the road to supervise this lecture work. Three million copies of the leaflet entitled "Come Clean" were printed and distributed to the men in class A.

The moving picture film "Fit to Fight" prepared by the Army Medical Department has been revised and the title changed to "Fit to Win" and is being shown before civilian audiences throughout the country.

A circular letter was sent to all of the retail druggists in the United States (about 47,000) asking that they discontinue the sale of venereal disease nostrums and cease counter-prescribing for venereal infections. A bulletin entitled "Responsibility of Druggists for the Public Health" was also sent to each of these druggists.

A circular letter will soon be sent to all of the physicians in the United States, asking that they cooperate in the fight against venereal diseases. This is Venereal Disease Circular No. 35. Seventy thousand copies of the Manual for the Treatment of Venereal Diseases are now in the hands of the printer and will be sent free of charge to each physician that replies to this appeal.

More than 17,000 letters have been received by the bureau as a result of the circular "War on Venereal Diseases to Continue." Out of this total number, only four contained adverse criticisms. All of the other letters received showed a deep interest and sympathy with the movement for control of venereal diseases throughout the country.

Following is a list showing the allotments made under the provisions of the Chamberlain-Kahn Act. Each of the States has received the allotment, with the exception of those marked with a star.

Alabama	$23,247.41
Arkansas	17,117.43
Arizona	2,221.95
California	25,851.07
Colorado	8,687.79
Connecticut	12,120.75
Delaware	2,199.84
*District of Columbia	3,598.72
Florida	8,182.47
Georgia	28,368.95
*Idaho	3,540.19
Indiana	29,366.62
Illinois	61,308.38
Iowa	24,194.56
Kentucky	24,898.14
Kansas	18,385.49
Louisiana	18,008.89
Montana	4,088.71
Michigan	30,555.01
Minnesota	22,569.18
*Missouri	35,808.43
Maryland	14,084.18
Mississippi	19,540.22
Maine	8,071.80
Massachusetts	$36,603.94
Nebraska	12,962.79
*New Mexico	3,558.74
Nevada	890.22
North Dakota	6,274.30
North Carolina	23,988.94
New Hampshire	4,681.62
New York	99,089.31
Oregon	7,315.04
Ohio	51,832.61
Oklahoma	18,017.23
*Pennsylvania	83,342.76
Rhode Island	5,899.80
South Dakota	6,348.61
South Carolina	16,476.95
*Tennessee	23,755.21
Texas	42,367.08
*Utah	4,059.33
Virginia	22,415.90
Vermont	3,870.31
West Virginia	13,277.22
Washington	12,416.85
Wisconsin	25,370.06
Wyoming	1,587.07

Medical and Surgical Relief.

War work of the marine hospitals.—The Executive order of the President dated April 3, 1917, made all marine hospitals of the Public Health Service available for the treatment of the enlisted personnel and officers of the Army and Navy whenever such treatment was requested by the proper military authorities. Of course the Army and Navy have their own hospitals, but it was expected that in many places where there is no regular military post or hospital, officers and enlisted men would be taken sick and require hospital treatment. In this way the marine hospitals practically acted as military hospitals in many cities. Notable examples of this are Savannah, Detroit, and Chicago. Besides Army and Navy personnel, civilian employees on vessels operated by the military authorities were admitted at many hospitals after the boats upon which they served had been torpedoed. This occurred especially at the marine hospital in Boston. Altogether, for the fiscal year ending June 30, 1918, there were treated at the United States marine hospitals and relief stations over 5,000 officers and enlisted men of the Army and Navy. Of this number approximately 1,000 were admitted to hospital for treatment, the remainder having been given treatment as out-patients in the dispensaries operated either in connection with the hospitals themselves or at other relief stations.

In addition to the foregoing, soldiers suffering from trachoma were admitted to some of the marine hospitals for treatment and in the majority of instances these were cured and returned to their respective commands.

Cooperation with Bureau of War Risk Insurance.—A direct outgrowth of the war activities of the Public Health Service is the plan to provide medical, hospital and sanatorium care for the beneficiaries of the Bureau of War Risk Insurance.

Already, with demobilization just begun, the War Risk Insurance Bureau has under medical treatment 1,724 beneficiaries (January 16, 1919).

Within a very short time hospital care will have to be provided for a considerable proportion of the 24,500 soldiers, sailors, and marines discharged from military service because of tuberculosis, and for the 50,000 cases of psychoneurosis, epilepsy, and other nervous and mental disorders reported among the military forces up to December 1, 1918. But this by no means exhausts the demands for hospital care which may be expected to be made upon the Public Health Service. According to the provisions of the war risk insurance act the Government is obligated to provide "such reasonable governmental medical, surgical and hospital services, and such supplies including artificial limbs, trusses and similar appliances as the director may determine to be useful and reasonably necessary." The application of such sick benefits is limited to illness contracted in line of duty, and it is further provided that symptoms must have appeared within a year after discharge from military service. In order to prevent the unnecessary duplication of hospital construction by various bureaus and departments of the Federal Govermnent, the suggestion was made that the hospitals in the present cantonments be utilized for the care of beneficiaries of the war risk insurance. In a bill recently passed by Congress, certain cantonment hospitals, together with the large and newly completed "Speedway" hospital in Chicago, are given over to the Public Health Service for the care of war-risk patients. In addition to this the bill provides for the establishment of sanatoria for the tuberculous in various parts of the country.

There is an advantage in having the hospital activities of the War Risk Insurance conducted by the United States Public Health Service; both services are lodged in the Treasury Department, and the Public Health Service already maintains a well-organized hospital service which, by law, stands obligated to treat:

1. Merchant seaman.
2. Employees of the Mississippi River Commission.
3. The United States Coast Guard Service.
4. The United States Lighthouse Service.
5. Employees aboard vessels of the Engineer Corps of the United States Army.
6. The United States Coast and Geodetic Survey.
7. Injured civil employees of the United States, under the Federal compensation act.
8. Civil employees on Army transports.

Miscellaneous Activities.

Sanitary engineering.—The sudden development of industrial towns and villages in connection with munition plants, shipyards, and the like resulted in a considerable number of requests to the Public Health Service for assistance in the solution of problems relating to water supply, sewage disposal, and the like. Some idea of the character of the activities thus carried on by the service may be gained from the following examples:

The citizens of Nashville, Tenn., became somewhat alarmed over the safety of their water supply when it was decided to locate a large Government explosives works on the Cumberland River, about 12 miles above the city. An investigation was made by the Public Health Service and a report submitted, including suitable recommendations for the disposal of sewage at the Government plant and for necessary additional safeguards to the water supply. Later, the question of the discharge of waste acid liquors into the Cumberland River was raised, and a board was appointed to consider this matter. Extensive studies were made and a remedial plan was worked out.

The attempt on the part of the city of Petersburg, Va., to furnish water to Camp Lee led to a shortage in the supply and inadequacy of treatment. An officer of the service investigated this situation and made recommendations toward general improvement of the supply. The city having declined to make the necessary changes, this matter was later referred to the War Department, which assumed charge of the entire waterworks.

Shortly after the signing of the armistice serious complaint arose in Milwaukee, Wis., over the alleged pollution of the drinking water by a phenol plant located south of the city and discharging wastes into the lake about 12 miles from the waterworks intake. Investigation by the service showed that the complaints were well founded. Recommendations were made that the matter be referred to the War Department, and that the contract under which the plant was operating be canceled. The operation of this plant was discontinued very shortly thereafter.

At the request of the Navy Department a visit of inspection was made to the marine camp, Quantico, Va., and a report with recommendations was subsequently submitted, with reference to the proper treatment and disposal of sewage of the camp.

A small factory at Gaithersburg, Md., engaged in canning beans for the War Department, had failed to provide proper means of disposal for its waste water and was seriously polluting a small stream. Complaints of nuisance in the town and of the poisoning of cattle were pressed and the closing down of the factory was seriously threatened. An investigation made by the service resulted in the construction of some temporary works which greatly relieved the situation and made it possible to continue the factory in operation throughout the remainder of the season.

In connection with service activities at Newport News, the importance of milk pasteurization led to the study of the possibilities of a central pasteurizing plant for that city. An officer of the service who had already made similar studies for Tuscaloosa, Ala., was assigned to this study and prepared complete plans and in part supervised the installation of this pasteurizing plant. The plant at this time is complete and in operation under the general supervision of the service.

A similar need for a satisfactory milk supply having arisen at the Government powder plant at Nitro, W. Va., plans were originally prepared for a pasteurization plant, but it was later decided to undertake at that point a demonstration of the possibilities of reconstructed milk. An officer of the Public Health Service accordingly prepared plans and supervised the construction of this plant. The operation has been most satisfactory, and an abundant supply of clean and wholesome milk was assured the city at a price considerably lower than normal city prices at the time.

Cooperation with other Government agencies, Council of National Defense, War Industries Board, Capital Issues Committee.—Actuated as it was by the desire to do all in its power to insure the success of the Nation's great undertaking, the Public Health Service gave freely of its services to other Government departments and to agencies engaged in war work. Mention has already been made of the cooperation with the military authorities and the American Red Cross in the sanitation of extra-cantonment areas and of the cooperation with the Bureau of War Risk Insurance in providing medical and surgical care for beneficiaries of the insurance fund. The Public Health Service also cooperated with the Council of National Defense, in the medical section of which the Surgeon General served as chairman of the committee on Hygiene and Sanitation. In the council's section on labor, the Public Health Service took an active part in matters relating to industrial hygiene; with the National Research Council it cooperated in a number of scientific investigations, and it furnished expert advice as to the health needs of civilian communities to the priorities committee of the War Industries Board and to the Capital Issues Committee.

United States Navy.—An important war activity of the Public Health Service was its cooperation with the Navy Department.

For the purpose of assisting in the protection of health of the Navy and thus aid in increasing the efficiency of the Navy as a fighting force, a medical officer of the Public Health Service was detailed as sanitation officer to each of the 14 naval districts in the United States.

In general the duties of these officers embraced the following:

1. To make regular inspections of the sanitary conditions of the naval stations and all places within the naval districts to which they are assigned, with special reference to water supplies, sewage, garbage and manure disposal, introduction, presence and disposition of cases of communicable diseases, the presence of disease-carrying insects, or of conditions favoring their growth, and to the facilities for messing and housing the personnel.
2. To secure information by personal observation and through civilian health authorities as to the prevalence of communicable diseases and sanitary conditions in the areas around naval stations and in localities from which recruits are collected.
3. To advise and assist in eradicating any communicable disease that may make its appearance in the district, and to make such epidemiological investigations as may be necessary and practicable.
4. To secure information as to the quality of water and milk supplied to both naval forces and civil population in the immediate environments of camps and stations, and as to methods of disposal of sewage, etc., in such localities.

5. To pay particular attention to the presence of disease-bearing and other mosquito-breeding areas either within the camp or within its immediate environment.

6. To determine as far as practicable the prevalence of venereal diseases in the civil communities adjacent to camps and stations, and the measures used for their control.

7. To make monthly inspection of the industrial establishments in the navy yards and make suitable recommendations, when necessary, for the correction of insanitary and unhygienic conditions.

Additional activities were undertaken as the needs arose. In the New York Naval District, for example, these included the inspection of various shipyards in the neighborhood where navy yard personnel was employed, the inspection of ships belonging to the transport cruiser force, and the fumigation of these vessels by the Navy personnel under the direction of the sanitation officer.

Publications Relating to War Activities.

An important function of the Public Health Service is the dissemination of information regarding public health matters. The following list of articles published by the service gives such a good idea of the war activities of the Public Health Service that its publication here may be of interest:

Trachoma and the Army—The Dangers Incident to Enlisting Recruits Affected with the Disease. By John McMullen.

Meningococcus Carriers—Their Recognition and Treatment.

Certain Military Aspects of Hookworm Disease. By Ch. Wardell Stiles.

The Lighting of Industrial Establishments—The Need for Supervision, with Suggested System of Maintenance Rating for Artificial Light Equipment. By Davis H. Tuck.

The Simulation of Disease—Drugs, Chemicals, and Septic Materials Used Therefor. By A. G. DuMez.

Trinitrotoluol—Practical Points in Its Safe Handling. By J. W. Schereschewsky.

Mitigation of the Heat Hazard in Industries. By J. A. Watkins.

Extra-Cantonment Zone Sanitation—Camp Shelby, near Hattiesburg, Miss. By J. A. Watkins.

Industrial Efficiency—The Bearings of Physiological Science Thereon—A Review of Recent Work. By Frederic S. Lee.

Morbidity Statistics of War Industries Needed. By B. S. Warren.

A State-wide Plan for the Prevention of Venereal Disease. By Allan J. McLaughlin.

Extra-Cantonment Zone Sanitation, Newport News, Va., and Vicinity. By S. B. Grubbs.

Methods for Field Study of Industrial Fatigue. By P. Sargant Florence.

Suggestions for State Board of Health Regulations for the Prevention of Venereal Diseases.

The Present Status of Our Knowledge of Fatigue Products. By Ernest L. Scott.

Progress in Venereal Disease Control. By J. G. Wilson.

The Dietary Deficiency of Cereal Foods with Reference to Their Content in "Antineuritic Vitamine." By Carl Voegtlin, G. C. Lake, C. N. Myers.

The Growth-Promoting Properties of Foods Derived from Corn and Wheat. By Carl Voegtlin and C. N. Myers.

Phosphorus as an Indicator of the "Vitamine," Content of Corn and Wheat. By Carl Voegtlin and C. N. Myers.

Some Qualitative and Quantitative Tests for Arsphenamine. By C. N. Myers and A. G. DuMez.

Dried Milk Powder—A Review of British Experience.

State and Federal Cooperation in Combating the Venereal Diseases. By J. G. Wilson.

Control of Diseases in Establishments for the Manufacture and Loading of High Explosives. Report of Divisional Committee on Industrial Diseases, Section of Sanitation, of the Committee on Labor, Council of National Defense.

Venereal Disease Control—Standards for Discharge of Carriers.

Regulations—Promulgated by the Secretary of the Treasury, under which State Boards or State Departments of Health Receive the Allotment of Funds provided in Section 6, Chapter XV, of the Act approved July 9, Entitled "An Act Making Appropriations for the Support of the Army for the Fiscal Year Ending June 30, 1919."

War Program of the Public Health Service—Intended Especially for Extra-Cantonment Areas and War Industrial Centers.

Sanitation of Rural Workmen's Areas—With Special Reference to Housing. Report of Divisional Committee on Village and Public Sanitation, Section of Sanitation, Committee on Welfare Work of the Committee on Labor, Advisory Commission, Council of National Defense.

Preliminary Report on Carbon Tetrachloride Vapor as a Delousing Agent. By H. M. Foster.

Maintenance of Health in Industries—Its Relation to the Adequate Production of War Materials.

Extra-Cantonment Zone Regulations—Regulations Governing the Sale of Food and Drink in the Special Sanitary Zone Around Camp Pike, near Little Rock, Ark.

Tetanus in Court-plaster—Results of the Bacteriological Examination of Fourteen specimens.

Diphtheria, an Epidemic, Probably of Milk Origin, Occurring at Newport, R. I., and Vicinity.

Arsphenamine (Salvarsan) Licenses Ordered and Rules and Standards Prescribed for Its Manufacture.

Venereal Disease Legislation—A Compilation of Laws and Regulations Showing the Trend of Modern Legislation for the Control of Venereal Diseases.

Physical Fatigue as a Factor in Increasing Susceptibility to Communicable Disease.

Anthrax from Shaving Brushes.

Industrial Fatigue—Investigation by Means of Factory Statistics.

The Reserve of the Public Health Service.

COOPERATION OF THE RED CROSS IN PUBLIC HEALTH SERVICE HOSPITALS.

Many of the soldiers, sailors, and marines who are undergoing examination and treatment in the hospitals operated by the United States Public Health Service are but recently discharged from military hospitals, where they have been the recipients of much kindness from volunteer organizations. Because of legal limitations which prevent the service from supplying these delicacies of comfort, the Surgeon General expressed the desire to the American Red Cross that it cooperate with the Public Health Service in supplying them. The activities to be undertaken are similar to those conducted by